# 5. Business Case Alternatives

During the business case development effort, two scenarios were considered for using technology-supported learning within the DOE. One scenario involves establishing a corporate approach for expanding the Department's existing technology-supported learning capabilities and for converting traditional lecture-based and self-study courses and materials into advanced training technology formats. The other scenario involves the continuation of the current non-corporate approach where organizational elements within the Department deliver education and training learning activities without the benefit of a corporate approach to technology-supported learning.

The concept of a "corporate approach" to education and training was identified in the Department of Energy's Strategic Alignment Implementation (SAI) Plan 44, Corporate Approach to Training. A corporate approach involves the collaboration of organizations and the sharing of resources across more than one business line in the Department.

The corporate approach to technology-supported learning takes full advantage of the enclaves of expertise that exist throughout the Department (such as the Central Training Academy, Pantex, Hanford, Fernald, Lawrence Livermore Laboratories, Richland, Rocky Flats, Stanford Linear Accelerator Center, and other laboratories and offices) as a basis for establishing Centers of Excellence (or lead sites) for advanced training technologies, and courseware development and delivery. A corporate approach to the implementation of advanced training technologies also acknowledges the Federal Government National Performance Review preference for programs that integrate advanced training technologies to improve Departmentwide productivity.

A non-corporate approach to education and training is one in which organizations make independent decisions for education and training development, delivery, and funding for their personnel without taking full advantage or consideration of programs, curricula, courses, and resources available from other organizations within the Department. In a non-corporate environment each organization is acting independently with minimal sharing of resources and information. Some of the consequences of a non-corporate approach include:

- Duplicate courses being developed and offered throughout the Department
- Inconsistent course content and learning objectives
- Inefficient use of technology, resources, and skills
- No common data base for information sharing

Originally, three corporate approach alternatives (A, B, and C) were developed to examine the relative benefits associated with different mixes of the technology-supported learning delivery methods. Each of these alternatives provided a delivery method mix that maximized one of the advanced training technologies; A focused on interactive television, B on multimedia, and C on the use of the Internet and high-speed networks. The descriptions of alternatives A, B, and C are provided in appendix F.

The Multi-Technology Solution (alternative D) represents a synthesis of the best features of alternatives A, B, and C. Alternative D optimizes the use of existing and projected investments in interactive television, multimedia, and the Internet rather than maximizing one delivery method. The description of the Multi-Technology Solution is provided in section 5.4.

Alternative E was developed to represent the continuation of the status quo. This alternative depicts the continuation of the Department's non-corporate approach to delivering education and training activities. The description of the Non-Corporate Approach is provided in section 5.5.

There is rarely just one way to attain a set of goals. The alternatives developed for this business case represent some of the most viable options known to date for achieving the Department's technology-supported learning goals. Many variations of the selected options are possible. As advanced training technologies evolve and Departmental technology resources change, different options, or variations, may emerge as being more practical and appropriate for the DOE environment.

## 5.1 Assumptions for Alternative Development

In preparing for the development of the alternatives, the following assumptions were made about the Federal and contractor facilities and personnel that comprise the DOE complex, and the acquisition and maturity of advanced training technologies during the 5-year period from fiscal years 1998 through 2002. These assumptions were identified during the second business case workshop.

- There will be significant reductions in Federal and contractor facilities and resources.

- Across-the-board qualification standards will be required for Federal employees.

- The outsourcing of service functions will increase.

- The privatization of DOE assets will increase.

- There will be increased acceptance, and utilization, of advanced training technologies.

- The Department will continue to evolve towards centralized coordination with decentralized design, development, and distribution of education and training through the use of Centers of Excellence.

- Computer-based training (CBT) will become more sophisticated through the use of enhanced graphics, animation, video, and sound. It is expected that thousands of programs will be available commercially.

- Internet access will be readily available to employees at all work stations. Increased bandwidth and compression techniques will allow greater use of multimedia capabilities.

- The lines that currently separate the capabilities of interactive television, multimedia, and Internet will gradually disappear, allowing true integration of these technologies, as well as other advanced technologies.

## 5.2 Technical Solution Models

The identification of the delivery methods to be used in the development of the alternatives was one of the primary objectives of the third business case workshop held in July 1996. The alternatives selected for this business case serve as models of different technical solutions. The models were built using a common set of parameters and assumptions that enable the comparison of different mixes of traditional and advanced training technologies. These models are needed to provide a basis for determining the most cost-effective alternative. The models are not intended to be real-time scenarios. The actual implementation of the recommended technical solution will involve resolution of many Departmentwide and site-specific issues that will affect the acquisition and distribution of technology (timing and quantity), and the selection, development, or conversion of specific courseware, and the achievement of organizational changes.

Within each alternative, four delivery methods are considered: interactive television (e.g., satellite) multimedia (e.g., computer-based training), Internet, and traditional (e.g., classroom). For the corporate approach alternatives (A, B, C, and D), the goal is to deliver 150 cross-cutting learning activities via advanced training technologies in a 5-year period from 1998 through 2002. The remaining learning activities will continue to be delivered via traditional methods. No attempt has been made to identify the specific learning activities that would be converted. This decision would be made on a case-by-case basis by subject matter experts using predetermined selection criteria within the framework of the Systematic Approach to Training.

The primary differences between the alternatives occur in one or both of the following areas: (1) the percentage of 150 cross-cutting learning activities that will be developed or converted for each delivery method (i.e., delivery method mix); and (2) the delivery method that will have the major focus for technology acquisition. Table 5-1 provides a summary of the delivery method mix for each alternative.

## Table 5-1.  Summary of Business Case Alternatives and Assumptions

| Delivery Method | Alternative Summary (for 5-year period) | | | | |
|---|---|---|---|---|---|
| | "A"<br>ITV Focus | "B"<br>Multimedia Focus | "C"<br>High-Speed Network Focus | "D"<br>Multi-Technology Solution | "E"<br>Non-Corporate Approach |
| Interactive Television (ITV) | 75 courses converted; 137,625 potential students | 19 courses converted; 34,865 potential students | 19 courses converted; 34,865 potential students | 45 courses converted; 82,575 potential students | 19 courses converted; 34,865 potential students |
| Multimedia | 45 courses converted; 115,200 potential students | 110 courses converted; 281,600 potential students | 110 courses converted; 281,600 potential students | 83 courses converted; 212,480 potential students | 10 courses converted; 25,600 potential students |
| Internet | 30 courses converted; 52,920 potential students | 21 courses converted; 37,044 potential students | 21 courses converted; 37,044 potential students | 22 courses converted; 38,808 potential students | 12 courses converted; 21,168 potential students |
| Traditional Delivery Methods | remainder of courses | remainder of courses | remainder of courses | remainder of courses | remainder of courses |
| Capital Investment (for 5-year period) | $9,221,562 | $10,407,508 | $10,407,508 | $9,184,487 | $3,385,149 |
| Operating Costs (for 5-year period) | $27,183,552 | $26,087,967 | $26,170,182 | $26,605,734 | $7,691,152 |
| Return on Investment (Net Benefit) for 5-year period) | $60,302,037 | $65,420,479 | $65,349,623 | $66,902,297 | $2,096,051 |

Note:  Return on Investment (Net Benefit) is obtained by subtracting the capital investments and operating expenses from the gross benefits

The presentation of each alternative is divided into the following sections.

**Description**: Highlights the important features of the alternative and provides information about the proposed delivery method mix of advanced training technologies.

**Approach for Meeting Training Needs** : Explains the overall implementation strategy. Partnering agreements will play a major role in providing cost-effective technology-supported learning. Several partnering opportunities are cited in the alternatives. As technology-supported learning delivery methods are implemented, partnering agreements will be explored and pursued on a case-by-case basis.

**Platform Descriptions**: Explains the platform requirements for each delivery method included in the delivery method mix.

**Technology Acquisition** : Explains the phased approach, by fiscal year, for acquiring technology and related organizational changes to support the implementation of the delivery method mix. Some alternatives will include establishing Centers of Excellence for multimedia development and delivery. For example, Development Centers of Excellence would create cross-cutting multimedia courseware. The courseware would be turned over to a delivery Center of Excellence for duplication, packaging, and distribution to DOE learning centers.

**Note:**  The technology acquisitions for fiscal year 1997 are provided for informational purposes only. The benefits and costs associated with fiscal year 1997 acquisitions are not included in the analysis of benefits and costs.

**Matrix**: Provides a tabular summary of the phased approach to the delivery method mix and technology acquisition. The matrix also includes estimates for the number of courses represented by the delivery method mix percentages, and the number of courses projected to be converted each year.

The potential number of students who could receive the training for each course that is converted is provided for each year. For example, it was estimated that in one year an average of 1,835 students across the DOE complex would have access to any course delivered via interactive television. If nine classroom-delivered courses are converted to an interactive television format in one year, then the potential exists for 16,515 students to participate in that interactive television training.

## 5.3  Comparison of Alternatives

An analysis of benefits and costs was performed on each alternative (chapter 6). The results of the analysis provide data for comparing the alternatives to determine which one provides the most desired benefits for the least cost and the best long-term return on investment. The return on investment for each business case alternative (A-E) is provided in table 5-1. This financial information was an important factor in the analysis of the alternatives and the development of the business case recommendations.

## 5.4  Multi-Technology Solution (Alternative D)

### 5.4.1  Description

This alternative is a synthesis of the other corporate approach alternatives (A, B, and C).  It focuses on optimizing the use of existing and projected Departmental interactive television, multimedia, and Internet resources, rather than maximizing one particular delivery method.  For example, interactive television is used to its projected maximum level that is possible without further studio or uplink acquisition.  Internet is projected to combine with multimedia only when high-speed network capabilities mature throughout the Department.  Viewed as projective rather than prescriptive, the 5-year goal for the Multi-Technology Solution is to deliver a minimum of 150 cross-cutting learning activities using the following delivery technology mix:

- 45 (30 percent) via interactive television
- 83 (55 percent) via multimedia
- 22 (15 percent) via Internet

The remaining learning activities, not delivered through advanced training technologies, are assumed to be delivered through traditional classroom and self-study methods.

### 5.4.2  Approach for Meeting Training Needs

A 5-year phased approach is assumed for implementation of the Multi-Technology Solution starting in fiscal year 1998.  This approach encompasses learning activity development and delivery, technology infrastructure acquisition, and organizational changes.  As is the case with all of the corporate approach alternatives, standards must continue to evolve for learning activity design and delivery to be compatible and widespread.  Acquisition of free courseware from partners outside the Department and from other sources would be expected to decrease the need for in-house development by 10-20 percent depending on the delivery method type.

The Multi-Technology Solution shares the delivery method focus between interactive television (alternative A) and multimedia (alternative B).  It represents a very probable scenario where the existing satellite uplink and downlink, and planned additional downlink facilities, are heavily used, but no additional uplinks are built.  Partnering may enable use of non-DOE-owned studios and uplink facilities.

Slightly fewer learning centers with slightly fewer multimedia computers are projected than would be acquired for alternative B, which focuses on multimedia.  Learning activities projected for multimedia (e.g., CD-ROM delivery at local learning centers and eventually the desktop) could be modified or easily re-purposed for Web delivery or both CD-ROM and Internet distribution and delivery.

This alternative does not take an overly optimistic view regarding the availability of high-speed networks capable of transmitting extensive multimedia information to the desktops, as projected in alternative C.  While it is believed that such capabilities will be in existence commercially and to

some extent within the DOE, Information Management (IM) representatives were not able to predict when the capabilities would be in widespread use across the Department.

The Multi-Technology Solution delivery method mix of learning activities for fiscal years 1998 through 2002 is shown in table 5-2 at the end of this section.

### 5.4.3  Platform Descriptions

**Interactive Television.**  The primary ITV platform provides an appropriate infrastructure for the delivery of interactive cross-cutting education and training learning activities via satellite to remote locations.  In the short term, both analog and digital satellite formats would be needed to accommodate current capabilities, since some DOE sites have analog and some have digital capabilities.  Also, some sites have fixed dishes and others have steerable dishes.  The long-term solution is to move toward a fully compatible, digital capability throughout the Department.

The platform for the first 3 years would be a satellite system that is compatible with the system in operation at the Central Training Academy (CTA) located at DOE facilities in Albuquerque, New Mexico.  Compressed digital video transmission would be used to satisfy one-way video requirements.  This transmission will be supported by terrestrial two-way audio and viewer response systems for student-instructor interactivity.

The ITV satellite platform consists of three basic components: broadcast studio, uplink-downlink capabilities, and receiver site capabilities.

- A fully operational broadcast studio is located at CTA.  It is assumed that this will be the primary DOE studio.  Partnering agreements with educational, Government, and commercial vendors will be explored for potential shared use of other studios.

- The CTA satellite uplink consists of a transmission dish along with encoding hardware.  It transmits one channel of live or recorded instruction to a satellite in geosynchronous orbit. Partnering agreements with educational, Government, and commercial vendors will be explored for potential shared use of other uplink capabilities.

- Each downlink will consist of a receive-only satellite dish and an integrated receiver/ decoder.  The Department already has 23 sites with satellite downlink capabilities that provide one-way video with two-way audio and one-way data.

- Each receive site will include, but not be limited to, television monitors, a viewer response system, video cassette recorder(s), and associated components.

Compressed video teleconferencing services (CVTS) and desktop video-conferencing would serve as secondary ITV systems.

- Compressed video teleconferencing services offer two-way video and two-way audio. Many sites already have compressed video teleconferencing capabilities that could be used for delivery of training.

- Desktop video provides two-way video with two-way audio and data. As a training delivery method, this technology provides point-to-point connection that is ideal for remote, one-on-one instructor-to-student training. The most common DOE platform for desktop video is an Intel-based personal computer.

Establishment of partnering agreements to deliver education and training learning activities is an aspect of this alternative that has not been fully explored. Many full-service educational institutions, tele-education, and tele-training companies (such as Wescott Communications, Elkins Interactive, and IDTN) provide complete production and uplink services or some part of those services. The Government Alliance for Training and Education (GATE) successfully completed a multi-agency partnering pilot project that used ITV to deliver ethics training to 7,000 federal employees.

**Multimedia.** The multimedia/CBT delivery platform includes a personal computer, digital audio, compact disc read-only memory (CD-ROM), color monitor, high resolution graphics, and a touch screen (optional). For the analysis of benefits and costs, the Intel-based personal computer is assumed to be the standard platform for multimedia delivery.

The multimedia/CBT courseware development platform includes authoring software and other development software that enhances courseware development and reduces programming time. Ideally, courseware could be obtained or developed that will run on Windows-based personal computers (as well as Macintosh and Unix platforms that can adequately support Windows applications and multimedia). A standardized platform is a key element to ensure that cross-cutting CBT courseware can be delivered at all sites. If a single platform is required, it will most likely be an Intel-based Windows platform.

**Internet.** No standard requirement has been identified for Internet-based training except that it should not be DOS-based. The standardization of browsers and plug-ins are considered more essential. "De facto" standards are evolving very rapidly and many are requiring powerful workstations to support useful features.

The following types of Internet World Wide Web pages are considered appropriate for delivery of education and training learning activities.

- Static Web pages are best for relatively low technology applications that are low in cost to convert, such as study guides or textbooks. Examples of appropriate types of training include: slide shows and linear CBT, canned simulations, hypertext and branching CBT, and text-only materials.

- Dynamic Web pages are best for interactive applications such as testing, practice exercises, and data base look-up applications. Examples of appropriate types of training

include server-based common gateway interface scripted, imbedded JAVA or shockwave applets/scripts, drill and practice, and free-play simulations.

### 5.4.4 Technology Acquisition

The following is a phased approach for the acquisition of the technology needed to successfully implement the Multi-Technology Solution. Also provided are organizational issues, such as the establishment of partnering agreements, that would support the technical implementation plan.

Fiscal Year 1997 (not included in the analysis of benefits and costs)

ITV: Install one uplink site at the Savannah River Operations Office as part of an arrangement negotiated with the National Technological University. Install five downlink sites.

MM: Establish standard hardware platform. Survey all sites for present capability and current assets. Identify sites performing courseware development and catalog their capabilities. Align all sites presently using multimedia to the coordination of learning activity development and deployment.

Fiscal Year 1998

ITV: Install 20 downlink sites. Upgrade infrastructure by adding integrated receiver/ decoders and site controllers to increase the number of learning activities that can be received from the satellite. Add keypads and training space to increase student capacity. Begin to explore partnering opportunities for additional uplink capabilities.

MM: Establish 75 learning centers throughout the DOE complex. Acquire and install a minimum of six multimedia workstations in each learning center. Solicit existing courseware from all DOE sites. Identify subject matter experts and establish courseware development and delivery method for Centers of Excellence.

NET: Establish standards for the World Wide Web (WWW) browser software. Adopt standards for the hypertext markup language (HTML) formats used within the DOE complex. Achieve 80 percent Internet connectivity across the DOE complex. It is assumed that this connectivity will be achieved through other DOE-wide or organizational level telecommunications enhancement initiatives.

Fiscal Year 1999

ITV: Upgrade infrastructure by adding integrated receiver/decoders and site controllers to increase the number of learning activities that can be received from the satellite and add keypads, and training space to increase student capacity. Establish partnering agreements for delivery of learning activities.

MM: Establish 40 additional learning centers throughout the DOE complex. Acquire and install a minimum of six multimedia workstations in each learning center.

NET: If possible through other initiatives, achieve 100 percent connectivity of all sites across the DOE complex. Purchase site licenses for browser software, including plug-ins necessary to deliver CBT/ITV learning activities.

Fiscal Year 2000

ITV: Upgrade network infrastructure. It is assumed that this upgrade will be achieved through other DOE-wide or organizational level telecommunications enhancement initiatives.

MM: Establish 35 additional learning centers throughout the DOE complex. Acquire and install a minimum of six multimedia workstations in each learning center. If possible, begin upgrading individual workstations. It is assumed that this upgrade will be achieved through other DOE-wide or organizational level information systems enhancement initiatives.

NET: Purchase and install network upgrades at each site where necessary to provide high-speed digital transmission. It is assumed that this upgrade will be achieved through other DOE-wide or organizational level telecommunications enhancement initiatives.

Fiscal Year 2001

ITV: Where possible, establish bridges to channel ITV broadcast to the desktop.

MM: Where possible, merge multimedia delivery with Internet capabilities and deliver learning activities via CD-ROM or the high-speed network.

NET: Begin delivery of CBT learning activities via Internet on the high-speed network.

Fiscal Year 2002

ITV: If possible, convert some ITV for delivery via high-speed network and merge with Internet capabilities.

MM: As possible, continue to merge multimedia delivery with Internet capabilities and deliver learning activities via CD-ROM or the high-speed network.

NET: As possible, begin delivery of ITV/video via Internet on the high-speed network.

## Table 5-2. Multi-Technology Solution (Alternative D)

| | Year 1 - 1998 | Year 2 - 1999 | Year 3 - 2000 | Year 4 - 2001 | Year 5 - 2002 | Totals for Each Method |
|---|---|---|---|---|---|---|
| **ITV**<br><br>Goal = 30%<br>of courses appropriate for TSL delivery<br><br>45 courses:<br> 1,835 average students/course each year | Install 20 downlinks. Upgrade infrastructure. Explore uplink partnering agreements. | Upgrade infrastructure. Establish partnering agreements for course delivery. | Upgrade network infrastructure. | If possible, establish bridges to channel ITV broadcast to desktop | As possible, convert some ITV for delivery via high-speed network and merge with Internet capabilities | |
| | Convert 9 courses | Convert 9 courses | Convert 9 courses | Convert 9 courses | Convert 9 courses | 45 courses converted |
| | 16,515 potential students | 16,515 potential students | 16,515 potential students | 16,515 potential students | 16,515 potential students | 82,575 potential students |
| **MM**<br><br>Goal = 55%<br>of courses appropriate for TSL delivery<br><br>83 courses:<br>2,560 average students/course each year | Establish 75 learning centers with at least 6 multimedia workstations each. Establish Centers of Excellence. | Establish 40 learning centers with at least 6 multimedia workstations each. | Establish 35 learning centers with at least 6 multimedia workstations each. Begin upgrading individual workstations. | Where possible, merge with Internet capabilities. Deliver via CD-ROM or high-speed network. | As possible, continue merge with Internet capabilities; Deliver via CD-ROM or high-speed network. | |
| | Convert 14 courses | Convert 15 courses | Convert 16 courses | Convert 19 courses | Convert 19 courses | 83 courses converted |
| | 35,840 potential students | 38,400 potential students | 40,960 potential students | 48,640 potential students | 48,640 potential students | 212,480 potential students |
| **Internet**<br><br>Goal = 15%<br>of courses appropriate for TSL delivery<br><br>22 courses:<br>1,764 average students/course each year | Establish standards for WWW browser software. Adopt standards for HTML formats used for TSL. Achieve 80% connectivity across DOE. | Achieve 100% connectivity across DOE complex. Purchase site licenses for browser software, including plug-ins necessary to deliver CBT/ITV. | Purchase and install network upgrades at each site where necessary to provide high-speed digital transmission. | Where possible, begin delivery of CBT via Internet on the high-speed network. | Where possible, begin delivery of ITV/video via Internet on the high-speed network. | |
| | Convert 1 course | Convert 4 courses | Convert 5 courses | Convert 6 courses | Convert 6 courses | 22 courses converted |
| | 1,764 potential students | 7,056 potential students | 8,820 potential students | 10,584 potential students | 10,584 potential students | 38,808 potential students |
| Totals for Each Year | 24 courses converted | 28 courses converted | 30 courses converted | 34 courses converted | 34 courses converted | 150 courses converted |

## 5.5  Non-Corporate Approach ( Alternative E)

### 5.5.1  Description

By fiscal year 2002, it is assumed that a minimum of 41 cross-cutting education and training learning activities would be delivered via advanced training technologies if the non-corporate approach to education and training continues.  Based on delivery method suitability characteristics derived from the application of the Distance Learning Appropriateness Screening Tool (DLAST), the following delivery method mix is assumed:

- 19 (46 percent) via ITV
- 10 (24 percent) via multimedia
- 12 (30 percent) via Internet

The remaining learning activities, not delivered through advanced training technologies, are assumed to be delivered by traditional classroom and self-study methods.

### 5.5.2  Approach for Meeting Training Needs

This alternative represents the non-corporate approach DOE organizations are currently using to develop and deliver education and training learning activities.  It is assumed that the organizations using advanced training technologies will continue to expand their efforts without the benefit of Departmentwide standards, processes, infrastructure, or development and delivery partnering agreements.  The following list includes some of the characteristics of the non-corporate approach.

- Limited sharing and dissemination of information regarding available resources and learning activities.

- No central source for administrative information related to the selection and delivery of learning activities.

- Significant redundancies in courseware development and availability.

- No standards for advanced training technology platforms.

- Each DOE site or organization is independently funding education and training opportunities for its own employees.

The Non-Corporate Approach delivery method mix of learning activities for fiscal years 1998 through 2002 is shown in table 5-3 at the end of this section.

### 5.5.3 Platform Descriptions

A detailed explanation of the various platforms are provided in the Multi-Technology Solution see (section 5.4.3).

**Interactive Television**.  Both analog and digital satellite formats are needed to accommodate current capabilities.  No plans are in place to adopt a standard platform for full compatibility across the Department.  Organizations are independently acquiring technology that is compatible with the delivery methods of the courseware providers they are using.  Compatibility will occur between sites that acquire downlinks for the satellite used by both the Central Training Academy and National Technological University.

**Multimedia**.  Courseware would be obtained or developed that will run on Windows-based personal computers, Macintosh or Unix platforms with multimedia equipment, but not necessarily all three.  No plans are in place to adopt a standard platform for full compatibility across the Department.

**Internet.**  No standard requirement has been identified for Internet-based training.

### 5.5.4 Technology Acquisition

The following approach is assumed for the acquisition of technology in the non-corporate environment of this alternative.  Also provided are organizational issues, such as the establishment of partnering agreements, that would be expected to evolve in support of the technical acquisitions.

Fiscal Year 1997 (not included in the analysis of benefits and costs)

    ITV:   Install one uplink site at the Savannah River Operations Office as part of an arrangement negotiated with the National Technological University.  Install five downlink sites.

Fiscal Year 1998

    ITV:   Install four downlink sites.

    MM:   Establish nine learning centers throughout the DOE complex.  Acquire and install a minimum of six multimedia workstations in each learning center.

Fiscal Year 1999

    ITV:   Install four downlink sites.

    MM:   Establish nine learning centers throughout the DOE complex.  Acquire and install a minimum of six multimedia workstations in each learning center.

NET: Achieve 80 percent connectivity of all sites across the DOE complex. It is assumed that this connectivity will be achieved through other DOE-wide or organizational level telecommunications enhancement initiatives.

Fiscal Year 2000

ITV: Install four downlink sites.

MM: Establish nine learning centers throughout the DOE complex. Acquire and install a minimum of six multimedia workstations in each learning center.

NET: Achieve 100 percent connectivity of all sites across the DOE complex. It is assumed that this connectivity will be achieved through other DOE-wide or organizational level telecommunications enhancement initiatives.

Fiscal Year 2001

ITV: Install four downlink sites.

MM: Establish nine learning centers throughout the DOE complex. Acquire and install a minimum of six multimedia workstations in each learning center.

NET: Upgrade networks to provide Internet access to all desktops. It is assumed that this upgrade will be achieved through other DOE-wide or organizational level telecommunications enhancement initiatives.

Fiscal Year 2002

ITV: Install four downlink sites.

MM: Establish nine learning centers throughout the DOE complex. Acquire and install a minimum of six multimedia workstations in each learning center.

NET: Upgrade desktop computers to support Internet access, where needed. It is assumed that this upgrade will be achieved through other DOE-wide or organizational level telecommunications enhancement initiatives.

## Table 5-3. Non-Corporate Approach (Alternative E)

| | Year 1 - 1998 | Year 2 - 1999 | Year 3 - 2000 | Year 4 - 2001 | Year 5 - 2002 | Totals for Each Method |
|---|---|---|---|---|---|---|
| **ITV**<br><br>Goal = 13% of courses appropriate for TSL delivery<br><br>1,835 average students/course each year | Install 4 downlink sites. | Install 4 downlinks. | Install 4 downlinks. | Install 4 downlinks. | Install 4 downlinks. | |
| | convert 3 courses | convert 4 courses | convert 4 courses | convert 4 courses | convert 4 courses | 19 courses converted |
| | 5,505 potential students | 7,340 potential students | 7,340 potential students | 7,340 potential students | 7,340 potential students | 34,865 potential students |
| **MM**<br><br>Goal = 7% of courses appropriate for TSL delivery<br><br>2,560 average students/course each year | Establish 9 learning centers with at least 6 multimedia workstations each. | Establish 9 learning centers with at least 6 multimedia workstations each. | Establish 9 learning centers with at least 6 multimedia workstations each. | Establish 9 learning centers with at least 6 multimedia workstations each. | Establish 9 learning centers with at least 6 multimedia workstations each. | |
| | convert 2 courses | convert 2 courses | convert 2 courses | convert 2 courses | convert 2 courses | 10 courses converted |
| | 5,120 potential students | 5,120 potential students | 5,120 potential students | 5,120 potential students | 5,120 potential students | 25,600 potential students |
| **Internet**<br><br>Goal = 8% of courses appropriate for TSL delivery<br><br>1,764 average students/course each year | | Achieve 80% connectivity across DOE complex. | Achieve 100% connectivity across DOE complex. | Upgrade networks to provide Internet access to all desktops. | Upgrade desktop computers to support Internet access where necessary. | |
| | convert 2 courses | convert 2 courses | convert 2 courses | convert 3 courses | convert 3 courses | 12 courses converted |
| | 3,528 potential students | 3,528 potential students | 3,528 potential students | 5,292 potential students | 5,292 potential students | 21,168 potential students |
| Totals for each year | 7 courses converted | 8 courses converted | 8 courses converted | 9 courses converted | 9 courses converted | 41 courses converted |

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